



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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Dee C. Hansen, Executive Director
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February 4, 1988

Ms. M.S. Litus
Environmental Engineer
Tenneco Minerals
P O Box 1167
Green River, Wyoming 82935

Dear Ms. Litus;

Re: Review of Notice of Intention to Commence Large Mining
Operations, Goldstrike Project, M/053/005, Washington County,
Utah

The Division has completed its review of your December 15, 1987 submittal for the above referenced mining operation. While the plan as a whole is a thorough and well done job, several areas of concern exist which must be addressed before the permitting process can continue.

The following comments identify the specific areas of concern. Each comment is referenced back to the section and page of your original submittal.

Drawing GS-001 - Claim Boundary Map

Please differentiate between BLM Lands (unpatented claims) and private lands (patented claims).

Item III-12, pages 23-26 - Toxic Materials

We are concerned with the acid forming potential of the sulfide ore found at the minesite. Please provide a description of how this material will be handled and the approximate tonnages involved. Will a separate extraction process be used on the gold bearing zones, or will all of the unoxidized material be rejected to waste dumps?

In order to quantify the acid forming potential, we request that an acid base analysis be conducted on several representative core samples from the sulfide zones. I have attached a brief description of the analysis procedure for your use.

Item III-3, pages 3-17 - Hydrology

In order to maintain the long term stability of the riprapped channel sections, we request that filter blankets of 3 1/2 inch minus crushed rock be installed under the riprap. This will help prevent piping of the parent soil material from beneath the riprap. Filter thickness should be approximately 1/2 the thickness of the riprap layer, but not less than 6-9 inches. In addition, it is important for the riprap to have a gradation such that the voids between the larger particals are filled with smaller particals to reduce flow beneath the rock and the formation of open pockets.

On page 6, the text states that all channels to be left as part of final reclamation are designed to pass the 100 year, 24 hour storm event. However, although they will be left for final reclamation, stream reaches C-J, L, M, O, Q and R have been designed for the 10 year, 24 hour event. Please provide updated design information for these reaches based on the 100 year event.

Based on the information contained on page 8 and drawing GS- , storm runoff from drainages 4-11, 14, 15, 19, 20, 23 and 24 will be routed to the 21.3 AF storm runoff impoundment north of waste dump #2. Our calculations show the total runoff volume resulting from the 100 year, 24 hour storm event to be 25.3 acre feet. Additionally, we feel that 3 years of sediment storage is inappropriate for a structure designed for a 100 year event. Please either update this information or provide calculations and assumptions supporting your design.

Generally, some of the problems with hydrological calculations identified above may stem from the fact that a distinction has not been made between operational and post mining hydrology. For example, regrading during reclamation is likely obliterate many of the smaller "temporary" drainages installed during the mining phase of the project. Routing of runoff also be altered due to topography changes during regrading, the most significant example being the leveling of the three, one million gallon process ponds. It is also likely that the regrading, topsoiling and revegetation of the affected land will have a large effect on the amount of runoff generated from the site.

Section V, pages 35-40 - Reclamation Plan

Review of drawing GS-12 (Post Mining Reclamation), shows basically no change in site configuration compared to drawing GS-8, representing the site configuration at the end of mining. This information coupled with the text, has led us to believe that virtually no regrading is proposed for final reclamation. We cannot approve such a proposal.

The outslopes of waste dumps, leach pad foundations, fill slopes and the heaps themselves must either designed or regraded to approximately 2(H):1(V).

In order to have a reasonable chance of success in reclaiming this site, slopes must be gentle enough to allow equipment operation for final grading, ripping, topsoil redistribution and seeding. In addition to the need for equipment access, gentler slopes provide the obvious advantage of keeping water and topsoil on the slope, providing a much more favorable environment for the establishment of vegetation.

Areas such as the heap benches, contractor's staging area, roads, pads, pond sites and crushing areas must be regraded to a rounded configuration. This requirement also applies to the abrupt changes in topography between heap cells.

We realize that topographic constraints will limit the amount of regrading which can be done in some areas. We propose that the specific areas which will not meet our requirements be outlined on drawing GS-11 and a request for slope variance for these items be added to Section VI on page 40.

The proposal on page 38 for end dumping topsoil on the leach pad foundation slopes cannot be approved. Topsoil has been shown to be a limited commodity at this project site and, as it is critical to the success of revegetation efforts, it must be evenly distributed on the project site.

Page 39, seeding - We do not recommend hydroseeding. However, if an area must be hydroseeded then the seeds should be covered with soil by some method.

Section VI, page 40 - Variances

Slopes - The operator has requested that highwall slopes between 50 and 56.3 degrees be left in some areas of the pits. This variance is approved with the understanding that if stability problems develop during mining or reclamation that site specific investigations and solutions will be implemented.

Impoundments - You have requested an impoundment variance for the Padre pit as it is the last pit to be mined and will not be backfilled. Additionally, you note that due to its mountaintop location, runoff into the pit will be minimal; and that any water that does collect in the pit should evaporate quickly. We concur with your justification and approval is granted.

Drainages and Dams - Your request for variance from dismantling the overflow containment pond is granted. We believe this structure will be beneficial to the post mining land use.

Section VII, pages 41-44 - Surety Estimate

Your surety estimate of \$259,130 is approximately 40 percent of the cost associated with similar reclamation projects. The estimate appears low for the following two reasons:

1. No costs have been included for such items as decommissioning of the heaps, water well abandonment, and supervision.
2. The amount of grading required on the roads, waste piles, and the heaps both before and during topsoiling appears to be underestimated. The unit cost per hour for the 32 yard scraper also appears to be low.

There is sufficient information in the plan for the Division to calculate the required amount of surety. However, Tenneco Minerals can also submit an amended estimate if so desired. This estimate should be prepared in accordance with the enclosed surety policy dated November 11, 1987. The current escalation factor is two (2) percent. If you decide to have the Division calculate the surety amount, it will still be advantageous for Tenneco to submit the contractor's quotes described in the bonding policy since these are usually less than rental rates.

Page 5
February 4, 1988
M.S. Litus

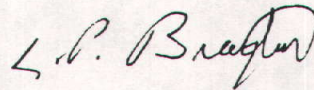
General Comments:

It is critical that the ponds and heaps be constructed in accordance with the approved plans. The Division may require quality control reporting if the Bureau of Water Pollution Control does not.

Please format any updated information so that we can insert it directly in the current notice of intention (i.e., replacement pages). This practice will ensure that we will both have a workable and readable plan for the future.

Thank you for your cooperation. Should you wish to discuss any of the above items in detail, please call me or Dave Wham.

Sincerely,



L. P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

DW

Enclosures

cc: M. Stairwalt, Tenneco, St. George
F. Rowley, BLM, Cedar City
K. May
F. Filas
D. Wham

0851R, 112

Surety Policy - Minerals Program
Division of Oil, Gas and Mining
November 11, 1987

Mine operations are required to post a reclamation surety with the Division and/or Board prior to final plan approval. The Division's policy concerning the calculation of the surety amount, surety adjustments, and the type of surety to be posted is summarized below.

Calculating the Amount of Surety

The surety amount for a mine is based on the maximum amount of reclamation work that would be required at any time during the surety estimate period. It is also based on the assumption that the Division would have to hire an outside contractor to reclaim the site. The Division, when calculating the surety amount, will take the following factors into consideration:

1. Equipment and Labor: The Division will accept a verifiable operator's estimate for the equipment and man-hours necessary to reclaim a site. If the operator does not provide this information, or the operator's estimate is obviously low, the Division will make the necessary estimates based on construction estimating handbooks and past experience with similar sites.
2. Equipment, Labor, and Material Costs: The Division prefers to use local contractor's rates and material costs. A written statement from three local contractors and/or vendors stating these costs should be provided by the operator to substantiate any rates to be used. Mobilization and shipping costs should be included in the written estimate. The Division will not accept the operator's equipment and labor rates since these would normally be lower than what the state would have to pay a private contractor.

If the operator does not provide the necessary cost information, and if the Division does not have recent cost lists for that region of the state, the Division will use rental rates and construction cost indexes in preparing the estimate. The salvage value of permanent structures can be used to offset the cost of their demolition. Salvage estimates should be made by an independent contractor and should be documented in writing.

3. Ten Percent Contingency: A ten percent contingency will be added to all reclamation estimates. This contingency is primarily to help defray the added cost to the state in the event of a surety forfeiture.

4. Escalation Factor and Estimate Period: Surety amounts are estimated for the amount of disturbance that will occur during a designated time period. The Division usually recommends a five year estimate, but any period of time of one year or greater can be used. The reclamation estimate will be inflated on an annual basis for the number of years used in the estimate. The escalation factor used is the average inflation rate during the prior three years as documented in the Mean's Historical Indexes. An example is given below.

Reclamation Estimate = \$20,000
Estimate Period = 5 years
Escalation Factor = 3.8% (1985's factor)

Surety Amount = \$24,100

A longer estimate period will require a larger surety to be posted. A shorter estimate period will require more frequent Division review and adjustments to the amount of surety.

5. Concurrent Reclamation: Whenever possible, the Division prefers plans which incorporate concurrent reclamation early in the mining cycle. Surety estimates for such plans will almost always be lower than those calculated for plans which postpone reclamation until the conclusion of mining.

Surety Adjustment

The surety amount posted shall reflect the cost to reclaim the mine site. The Division will review a surety estimate at the operator's request or when the following conditions may warrant an adjustment:

1. A portion of the site has been reclaimed or anticipated mine development has been delayed.
2. The mine is to be expanded beyond the area of the surety estimate.
3. The mine and reclamation plan is to be changed significantly.
4. The surety estimate period has elapsed.
5. The inflation rate has been significantly lower or higher than the escalation factor which was used in the estimate.

When a mine has been reclaimed, it is Division policy to keep a portion of the original surety amount to insure the repair and revegetation of any areas which might subsequently erode or show poor vegetative growth. This "revegetation surety" will be released when the reclaimed site has achieved at least 70 percent of the original vegetative ground cover after three growing seasons unless waived by the Division.

Types of Surety

The surety arrangements listed below are accepted by the Division. The appropriate Division form must be completed and attached to surety bonds and collateral arrangements. It is not necessary to post a separate surety with the Division if the operator has already posted an adequate reclamation bond with the land managing agency.

1. Surety Bond: A corporate surety bond executed with a surety or fidelity corporation authorized to do business in Utah and with a Best's rating of "A" or better.
2. Surety in the Form of Collateral: Certificates of deposit, treasury notes, irrevocable letter of credits, or escrow accounts may be used as collateral.. These are explained in greater detail below.
 - a. A federally insured automatically renewable certificate of deposit can be made payable to the Department of Natural Resources, Division of Oil, Gas and Mining. A certificate which is made payable to the Division "and/or" purchaser, or one which allows the bank to redeem the certificate after giving notice to the Division, are not acceptable. An assignment of deposit should be executed with a Utah bank. The assignment of deposit is to be filed with the Division while the bank holds the certificate.
 - b. United States treasury notes can be deposited in a Utah bank and an assignment of deposit filed with the Division.
 - c. Irrevocable letters of credit payable to the Department of Natural Resources, Division of Oil, Gas and Mining, can be issued by a Utah bank. The letter must be payable to the Division in part or in full upon demand.
 - d. An escrow agreement can be set up with the Division using a bank organized to do business in Utah.

3. Self Bond: The operator may complete a self bonding agreement with the Board of Oil, Gas and Mining if the mine has been in continuous operation under the current operator for at least five years and if the operator meets one of the following criteria:

a. A current rating of "A" or higher for the most recent corporate bond issuance. The rating will be determined by Moody's Investor Service or Standard and Poor's Corporation;

or

- b. (1) tangible net worth of at least \$10 million or fixed assets in the United States of at least \$20 million; and,
- (2) the ratio of total liabilities divided by net worth is 2.5/1 or less; and
- (3) the ratio of current assets divided by current liabilities is 1.2/1 or greater.

All financial statements must be prepared by an independent certified public accountant in conformity with generally accepted accounting principles.

4. Board Contract: The Board may accept an operator's guarantee to reclaim a mine in lieu of posting one of the three types of sureties listed above. A Board Contract will be considered in only limited instances. The operator will be required to appear in a formal board hearing and justify the application.

Acid Base Potential (ABP) Analysis

The Acid Base Potential is determined by calculating the difference between the neutralizing potential (NP) and the acid potential (AP) of a sample. Both the NP and AP should be determined in the laboratory by the methods perscribed below for total non-sulfate sulfur (AP) and carbonates (NP). The acid potential should be reported as % S, and the neutralizing potential as tons CaCO_3 equivalent per 1000 tons of material.

The AP must then be converted to tons CaCO_3 /1000 tons overburden material.

1. $\text{AP} = \% \text{S} \times 31.25 = \text{tons } \text{CaCO}_3 / 1000 \text{ tons material}$
2. $\text{ABP} = \text{NP} - \text{AP}$

Test methodology can be found in:

US EPA. 1978. Field and Laboratory Methods Applicable to Overburdens and Mine Soils. EPA-600/2-78-054.

For total non-sulphate sulphur, use method 3.2.6 on Page 60.
For neutralizing potential, use method 3.2.3 on page 47.